

Work Order ID 84672

May-30-12 3:47:54 PM

Duplicate

84672

Page 1

Item ID: D350-748-241TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/05/13 Tooling:

Date:

Run Start ***NR1***

QC:

Date: SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-241

F

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends as per Folio FA647

2-Turn first side as per Folio FA647

3- File transition lines smooth.

FOLIO REV:

DWG REV: F

T / Kc 12-6-10

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

1 / Kc 12-6-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

84672

May-30-12 3:47:54 PM

N900040100

Setup Start *NS1*

Stop *NS2*

*** 1 ***

Cust Item ID:

*** 1 ***

Customer:

Reference:

Run Start *NR1*

Approvals: **Process Plan:** **Date:** **Tooling:** **Date:**

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

120

120

Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

1-Turn second side as per Folio FA647
2- File transition lines smooth.
3-Scribe part # as per Dwg D350-748-241
FOLIO REV: _____
DWG REV: FE

0.00

0.00

130

130

QC

Quality Control

QC1- Inspect dimensions to dimension sheet

0.00

Memo

0.00

140

140

OC

Quality Control

QC8- Inspect parts - second check

0.00

Memo

0.00

W/O:		WORK ORDER CHANGES					
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Work Order ID 84672

84672

Page 3

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Item ID: D350-748-241TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

0.00

150

Large Fab

0.00

Crosstubes

Memo

Crosstubes

1-DRILL HOLES FOR HEAT TREAT USING DT9806(HOLES MUST BE
ALIGNED ON SAME LINE ON BOTH CUFFS)

- DE 12/07/24

2-Grind machining marks

Rm

12-7-30

160

0.00

160

Outsource process - Heat Treat

0.00

Outsource1

Memo

Outsource process - Heat Treat

Issue P/O:

Heat Treat to min 180 KSI As per Dwg D350-748-241

Sand Blast tube after Heat Treat

Possible Supplier: Vac Aero

Ensure Certificate of Conformity is attached

12-08-2

170

0.00

170

Receive & Inspect for Damage & Mat'l Certs

0.00

Packaging

Memo

Packaging

Ensure certificate of conformaty is attached

1x

12-8-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID 84672

84672

Page 4

May-30-12 3:47:54 PM

Item ID: D350-748-241TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Turning Detail

Stop ***NS2***

Start Date: 17/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

180 QC6- Inspect dimensions to drawing 0.00

180

QC Memo 0.00

Quality Control

Pho →

190 Packaging 0.00

190

Packaging Memo 0.00

Packaging Identify and stock in kanban rack
Location: LG

JW 12-10-3

200 QC21- Final Inspection - Work Order Release 0.00

200

QC Memo 0.00

Quality Control

MLJ 12-09-28

MLJ 12-09-28

W/O: 64672		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

See Pink
method
12-1875

Part No: D350-740-2411RN PAR #: _____ Fault Category: Y-tube NCR: Yes No DQA: Full Date: 12/16/11
 Resolution: _____ Disposition: Re-work QA: N/C Closed: CE Date: 12/16/11

NCR: 12-1874		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief-Eng	Action Description Chief Eng	Sign & Date			
12/08/28	#	tube ARE NOT Straight. AND ARE NOT Sandblasted R.C. SUMMER	 02/04/2 12/08/28	Build off Heat treating State Before Bending try to straighten out	 12-8-28	 12-8-28	 02/04/2 12/08/28	

NOTE: Date & initial all entries

Picklist Print

May-30-12 3:47:58 PM

Page 1

Work Order ID: 84672

84672

Parent Item: D350-748-241TRN

D350-748-241TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 17/05/2012

Required Date: 22/05/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec
IPP Rev B Removed polish 08.04.02 EC verified by : DD
IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD IPP Rev D
11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125		Manufactured	No			120	Each	38.0000	1	1			

D6015-125

Crosstube Material

**

Location

Loc Qty

Loc Code

HALL

38

61380

4

7251

34

1 name 12/06/07

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 84672
Description: Crosstube Assembly (AS350/355 High Aft)		Part Number: D350-748-241
Inspection Dwg: D350-748-241 Rev: F		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.245	/		VERN	CNC-08
	2.180	+0.005/-0.000	2.183	/			
	2.180	+0.005/-0.000	2.184	/			
	2.208	+0.005/-0.000	2.213	/			
	2.234	+0.005/-0.000	2.239	/			
	2.253	+0.005/-0.000	2.258	/			
	2.272	+0.005/-0.000	2.277	/			
	2.299	+0.005/-0.000	2.304	/			
	0.063	+/-0.010	.063	/		RG	
	4.26	+/-0.030	4.26	/		VERN	CNC 08
	R0.063	+/-0.010	.063	/		RG	
	R0.50	+/-0.030	.50	/		RG	
	2.240	+0.005/-0.000	2.244	/		VERN	CNC-08
	2.180	+0.005/-0.000	2.183	/			
SIDE B	2.180	+0.005/-0.000	2.184	/			
	2.208	+0.005/-0.000	2.213	/			
	2.234	+0.005/-0.000	2.239	/			
	2.253	+0.005/-0.000	2.258	/			
	2.272	+0.005/-0.000	2.277	/			
	2.299	+0.005/-0.000	2.304	/			
	0.063	+/-0.010	.063	/		RG	
	4.26	+/-0.030	4.314	/		VERN	CNC 08
	R0.063	+/-0.010	.063	/		RG	
	R0.50	+/-0.030	.50	/		RG	
	122.70	+/-0.060	122.70	/		type	LG-15

Measured by: JMM/RL	Audited by: [Signature]	Preliminary Approval:
Date: 12/06/08	Date: 12-6-11	Date:

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH = 122.700±0.06
- FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- IDENTIFICATION: DART PART NUMBER 'D350-748-241' AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 29.85 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER
BENDING.
- BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED OUT AFTER TORQUING.
- MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 84672 MCLJ
12/05/31

RELEASED
2011-01-08
MP

F	ADD HRC TEST OPTION (88-1) PER PAR 08-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES: UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	DP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DP		
CHECKED	DP	DRAWING NO.	REV. F
MFG. APPR.	DP	D350-748-241	SHEET 1 OF 4
APPROVED	DP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

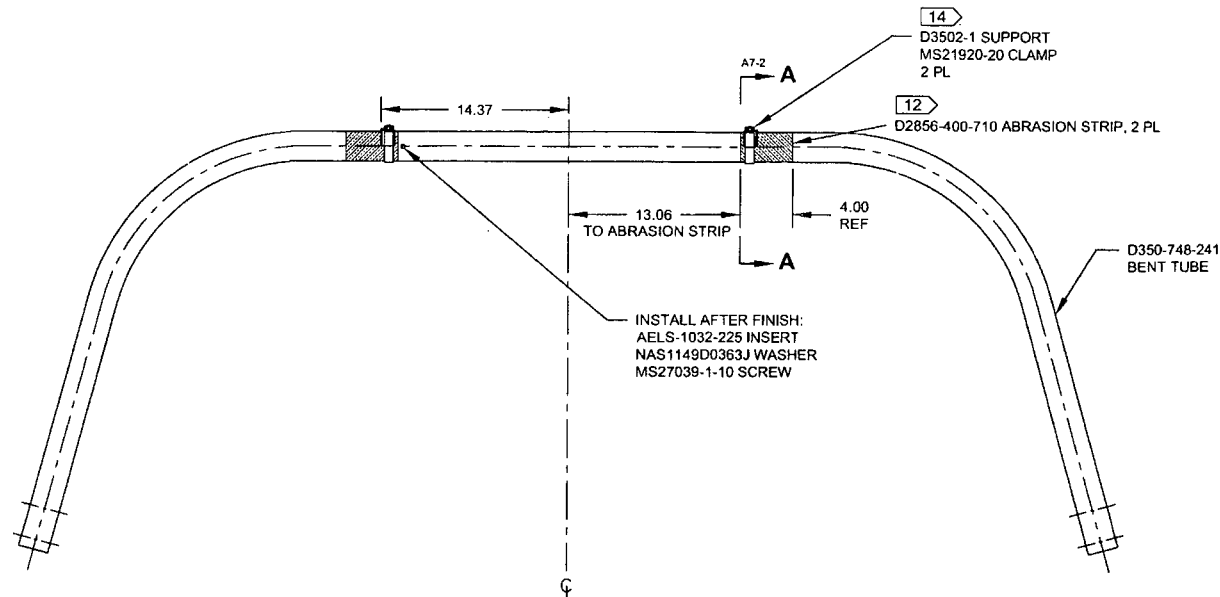
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

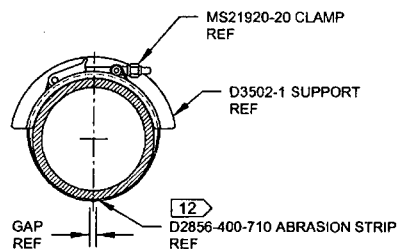
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

84672



**D350-748-241
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

RELEASED
2011-02-18

DESIGN	90	DART AEROSPACE LTD	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	15	DRAWING NO.	REV. F
MFG. APPR.	15	D350-748-241	SHEET 2 OF 4
APPROVED	15	TITLE	SCALE
DE APPR.	15	CROSSTUBE (AS 350/355 HI AFT)	NTS
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

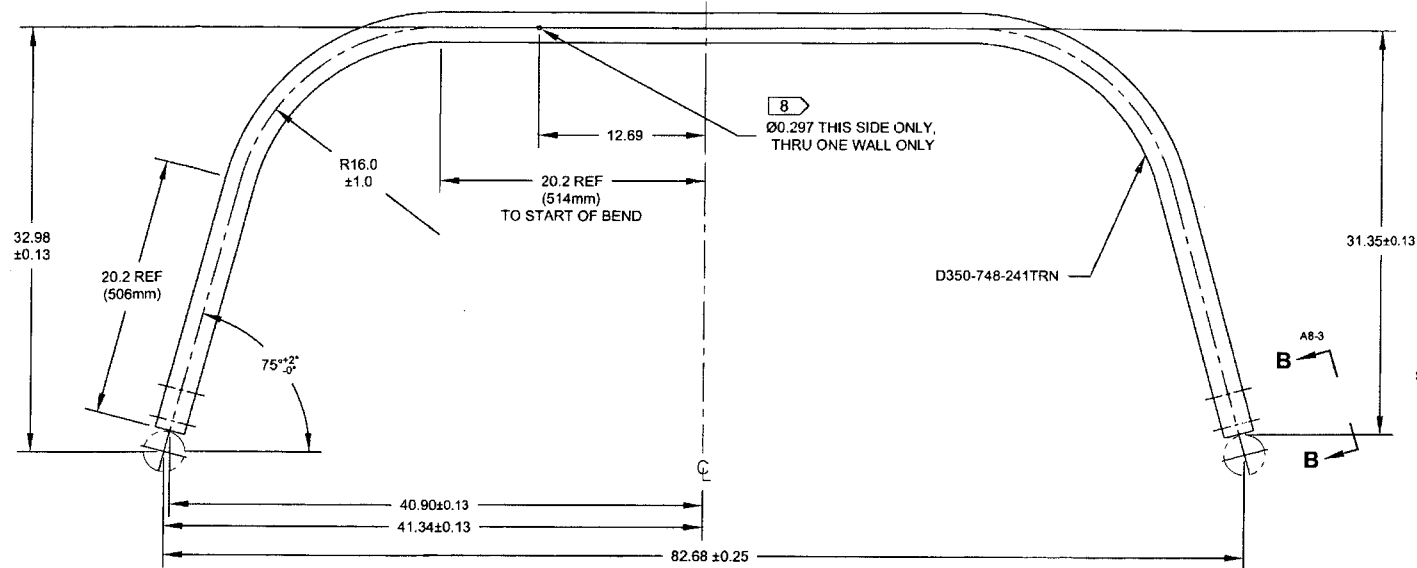
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

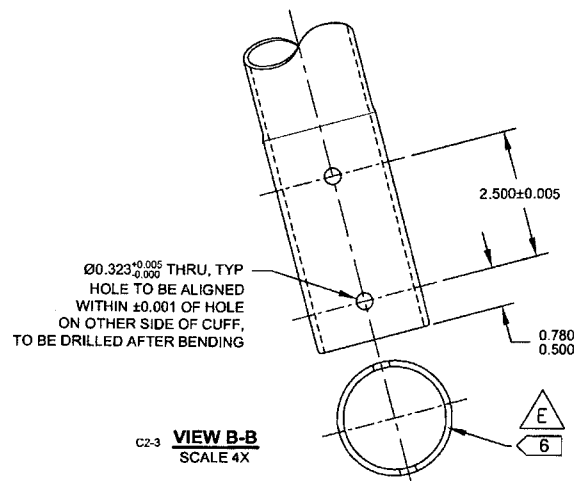
8 7 6 5 4 3 2 1

24672



D350-748-241
BENDING AND DRILLING DETAIL 10

RELEASED
R 2011-01-18



DESIGN	qp	DART AEROSPACE LTD	
DRAWN	qp	HAWKESBURY, ONTARIO, CANADA	
CHECKED	qp	DRAWING NO.	REV. F
MFG. APPR.	qp	D350-748-241	SHEET 3 OF 4
APPROVED	qp	TITLE	SCALE
DE APPR.	qp	CROSSTUBE (AS 350/355 HI AFT)	NTS
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8 7 6 5 4 3 2 1

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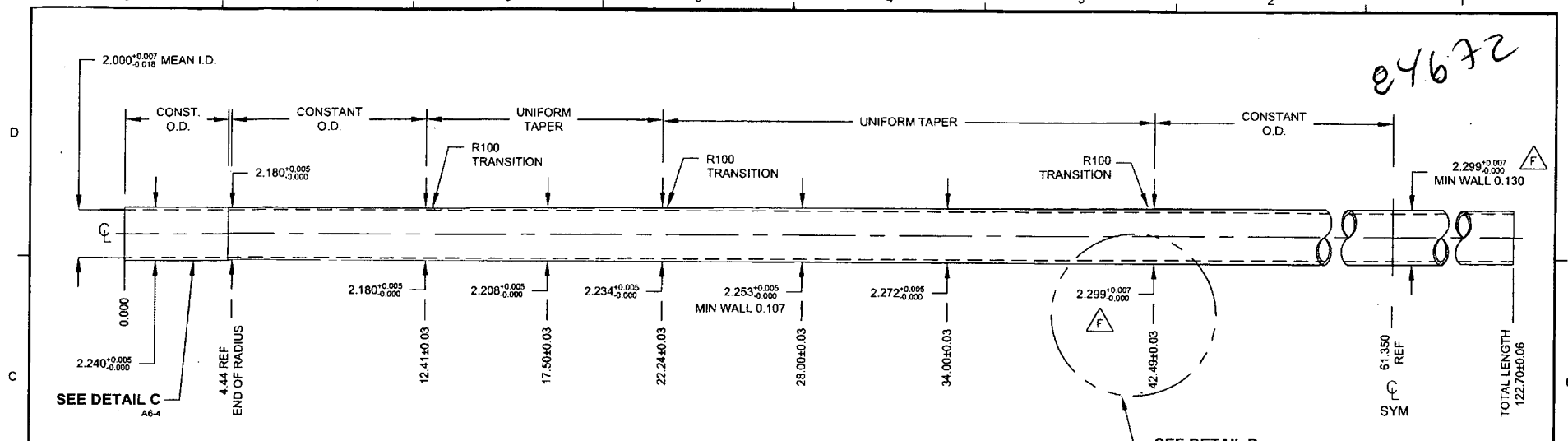
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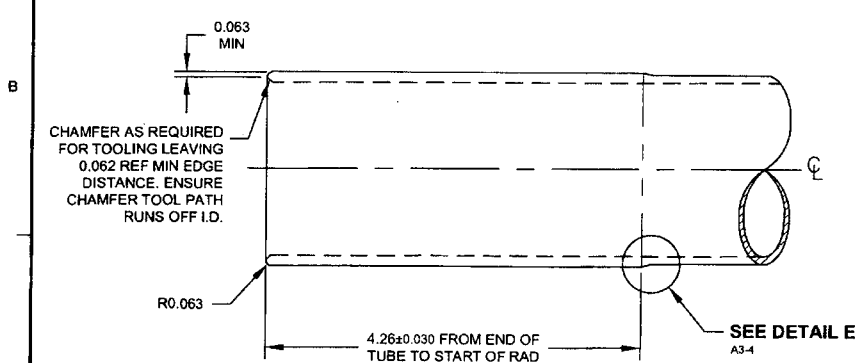
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24672

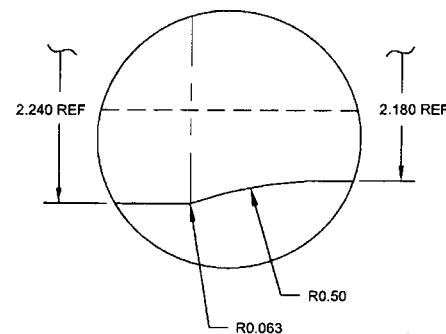


**D350-748-241TRN
TURNING DETAIL**

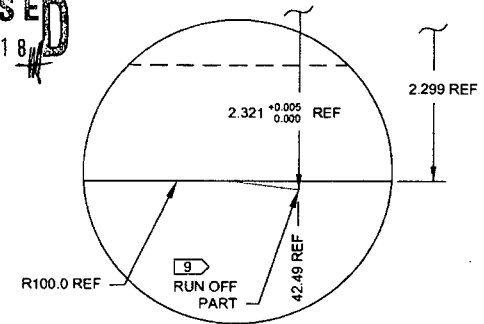
RELEASED
2011-01-18



**DETAIL C:
CROSSTUBE CUFF** C6-4
SCALE 3X



**DETAIL E:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL D:
TAPER RUN-OFF** C3-4
NOT TO SCALE

DESIGN	9P	DART AEROSPACE LTD	
DRAWN	9P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9P	DRAWING NO.	REV. F
MFG. APPR.	9P	D350-748-241	SHEET 4 OF 4
APPROVED	9P	TITLE	SCALE
DE APPR.	9P	CROSSTUBE (AS 350/355 HI AFT)	NTS
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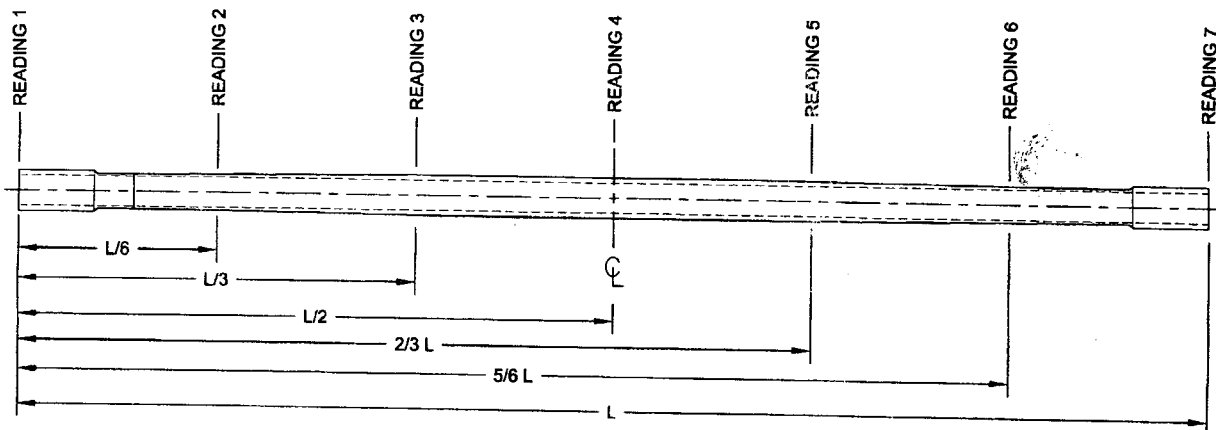
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DART AEROSPACE LTD		Work Order:	84672
Description: Crosstube Assembly (AS350/355 High Aft)		Part Number:	D350-748-241
Inspection Dwg: D350-748-241 Rev: F		Page 2 of 2	

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.125	.125	.130	.130	.005	0.030"
READING 2 L=	.119	.120	.124	.121	.005	
READING 3 L=	.156	.153	.157	.158	.005	
READING 4 L=	.153	.149	.157	.162	.013	
READING 5 L=	.152	.154	.160	.158	.008	
READING 6 L=	.098	.120	.143	.124	.045	
READING 7 L=	.113	.130	.135	.123	.017	

Calibration Result

Actual Block Thickness: _____

Sitescan 250 Measured Thickness: _____

Measured by:	KC
Date:	12-7-10

Audited by:	DP
Date:	12-6-11

Preliminary Approval:	
Date:	

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	
C	12.06.04	Wall thickness form added	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

LAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Sales Order
 Aug 8,

Voice: 215-233-2600
 Fax: 215-233-5653

Sold To:
 DART AEROSPACE
 1270 ABERDEEN STREET
 HAWKESBURY, ON K6A 1K7

Ship To:
 DART AEROSPACE
 1270 ABERDEEN STREET
 HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
	Ship Via	Process
	R & L CARRIER	

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		

EP 12-8-21

COMMENTS

SHIPPED BY, SIGNATURE
 METLAB

DATE

RECEIVED BY, SIGNATURE
 DART AEROSPACE

DATE

Packing I

Sales Order Num

7

Sales Order

Aug 8,

LAB**1000 E. MERMAID LANE
WYNDMOOR, PA 19038**

Voice: 215-233-2600

Fax: 215-233-5653

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
	Ship Via	Process
	R & L CARRIER	

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 84672 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84669 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84677 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL		

SEP 12-8-21

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D:

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17601		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73369		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensio
1		1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84672		205.000	20

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal	Contir
Shipping/Handling	
Total Invoice Amount	Contir
Payment Received	
TOTAL	Contir

Visit our Web Site: <www.thomasregister.com/metlab/>



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17601		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73369		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensi
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84669		205.000	20
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84677		205.000	20
		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL			

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card




Heat Treating and Metallurgical Consulting

Subtotal	1,23
Shipping/Handling	
Total Invoice Amount	1,23
Payment Received	
TOTAL	1,23

Visit our Web Site: <www.thomasregister.com/metlab/>

North American Free Trade Agreement Certificate of Origin

Please print or type

1. Exporter's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		2. Blanket Period: (dd/mm/yyyy) From: 01/01/2012 To: 31/12/2012			
3. Producer's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		4. Importer's Name and Address: Dart Aerospace 1270 Aberdeen Street Hawkesbury, ON K6A 1K7 CANADA Tax Identification Number:			
5. Description of Good(s)	6. HS Tariff Classification Number	7. Preference Criterion	8. Producer	9. Net Cost	10. Country of Origin
 Heat Treatment Services	 8483.401	 C	 Yes	 No	 USA
11. I CERTIFY THAT: <ul style="list-style-type: none"> * the Information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document; * I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate; * the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and * this Certificate consists of <u>One (1)</u> page, including all attachments. 					
Authorized Signature: 			Company: Metlab		
Name: Mark Podob			Title: Vice President		
Date: (mm/dd/yyyy) 8/16/2012		Telephone: 215-233-2600		Fax: 215-233-5653	



1000 E. Mermaid Ln., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5663

ORDER ACKNOWLEDGEMENT

613 632 1053

E-MAILED TO: _____

FAXED TO: _____

QF-4.722-01

Rev A 5/10/10

CUSTOMER: <u>Dart Aerospace</u>	PO NUMBER: <u>P017601</u>
DATE MATERIAL RECEIVED: <u>8/8/2012</u>	METLAB QUOTE NUMBER: <u>N/A</u> Or, MINIMUM STD ORDER(CHECK)
ESTIMATED SHIP DATE: <u>8/15/12</u>	METLAB S.O. NUMBER: <u>73369</u>

THANK YOU FOR YOUR ORDER. WE WILL MAKE OUR BEST EFFORT TO SHIP YOUR ORDER ON OR BEFORE THE ESTIMATED SHIP DATE SHOWN ABOVE. IF YOU NEED TO CONTACT US REGARDING THIS ORDER, PLEASE REFERENCE THE METLAB S.O. NUMBER SHOWN ABOVE.

QUOTATION MISSING? ☒ OK TO PROCESS WITHOUT DK

PURCHASE ORDER MISSING? _____ OK TO START PROCESSING WITHOUT _____

NOTE THAT WE NEED THE FOLLOWING INFORMATION IN ORDER TO COMPLETE YOUR ORDER AND TO MEET THE PROMISED SHIP DATE:

TECHNICAL INFORMATION REQUIRED(LIST) : _____ ON HOLD : YES _____ NO _____

OTHER INFORMATION OR CLARIFICATION: _____ ON HOLD : YES _____ NO _____

RELEASED FOR PROCESSING BY: DK DATE: 8/8/12

ACKNOWLEDGED BY: _____

TODAY'S DATE: _____

SHIPPED DATE: _____

THIS ORDER IS ACKNOWLEDGED WITH THE UNDERSTANDING THAT THE ABOVE PURCHASE ORDER IS IN ACCORDANCE WITH METLAB'S TERMS AND CONDITIONS OF SALE AS SUBMITTED AT THE TIME OF THE ABOVE QUOTATION.



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 1 of 2

Order From :

VU-MET001

METLAB

1000 E. MERMAID LANE

WYNDMOOR, PA 19038

USA

Contact Name

Vendor Phone

215-233-2600

Vendor Fax

215-233-5653

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

USD

FOB

Destination-Collect

Ship To :

DART AEROSPACE LTD

1270 ABERDEEN

HAWKESBURY, ON K6A 1K7

CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	86987 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-1C) SAND BALST TUBE AFTER HEAT TREAT CERTIFICATIONS				
2	86988 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	SAME AS ABOVE				
3	84668 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	SAME AS ABOVE				

SP 12-8-21

Change Nbr: 1

Change Date: 8/2/2012

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 2 of 2

Order From :

VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name		Buyer	Brigitte Golden
Vendor Phone	215-233-2600	Requisition Nbr	
Vendor Fax	215-233-5653	Tax Resale Nbr	10127-2607
Vendor Account Nbr		Terms	Net 30
		Currency	USD
		FOB	Destination-Collect

4	84672 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes				

Special Inst: Same As above

5	84669 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes				

Special Inst: Same as above

6	84677 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes				

Special Inst: Same as above

PO Total: \$1,230.0

48128-21

Change Nbr: 1

Change Date: 8/2/2012

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO

Brigitte Golden

From: Mark Podob <mpodob@metlabheattreat.com>
Sent: Thursday, August 02, 2012 10:15 AM
To: Doris Funches; Dan Krackovic; Eugene Roberts
Cc: Brigitte Golden
Subject: FW: New PO17601 from Dart
Attachments: D350-748-241-RevF.pdf; PO17601 Metlab.pdf

Importance: High

New P.O. from Dart.

Mark Podob
Vice President, Marketing and Sales
Metlab
1000 E. Mermaid Lane
Wyndmoor, PA 19038
215-233-2600 Ext. 232
(F) 215-233-5653
mpodob@metlabheattreat.com

This message and any attachments are intended for the individual or entity named above. If you are not the intended recipient, please do not forward, copy, print, use or disclose this communication to others; also please notify the sender replying to this message and then delete it from your system.

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Thursday, August 02, 2012 9:59 AM
To: Mark Podob
Cc: 'Linda Lacelle'
Subject: New PO17601 from Dart
Importance: High

Good Morning Mark!
Please find attached new PO for 6 crosstubes to be heat treated.
They are leaving today with Day & Ross this afternoon, tracking # OTT 19872092

Thank You

Brigitte Golden
Order Processing
DART AEROSPACE Ltd.
1270 Aberdeen Street
Hawkesbury Ontario
Canada K6A 1K7
Tel: (613) 632-5200 Ext 224
Fax: (613) 632-1053
bgolden@dartaero.com



Please consider your environmental responsibility before printing this e-mail

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Friday, July 27, 2012 11:19 AM
To: 'mpodob@metlabheattreat.com'
Cc: 'Linda Lacelle'
Subject: PO17555 from Dart

Please find attached the PO
Thank You

From: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Sent: Thursday, July 26, 2012 2:36 PM
To: mpodob@metlabheattreat.com
Cc: Brigitte Golden
Subject: more tubes

Hi Mark,

We will be shipping out 9 tubes tomorrow for heat treat. Another batch should follow end of next week. As always, I need these asap..

Thx!

Linda Lacelle
Production manager
Dart Aerospace



Commercial Invoice:145

Ship From: Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel # 1.613.632.5200
GST # RT101272607

Ship To: METLAB
1000 E Mermaid LN
Wyndmoor
PA, 19038 US

ATTN: Mark Podob
PH# 215 233 2600

Date: 2-Aug-12 **P.O. #** 17555

Broker: UPS SCS
PH#: 800 443-6379

Ship Via: Day & Ross PPD **FOB:Origin**

Item	Part Number / Product Description	Tariff Class.	Quantity	Unit Price	Total
1	Crosstube D350-748-241	8803.20	6	\$ 1,250.00	\$ 7,500.0
2					
3					
4					

All Prices are in US Dollars

All of the above parts were made in Canada unless otherwise indicated
THIS IS A CUSTOMS INVOICE ONLY

Sub Total \$7,500.00

Total \$7,500.00

Amount Due: \$7,500.00

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel.: 1.613.632.5200
Fax: 1.613.632.1185
GST # RT101272607



STRAIGHT BILL OF LADING - 1.866.DAY.ROSS

OTT 1987209 2



NIR R-500048-5

BILLER INIT. (INITIALES PROPRIETAIRES) À LA FACTURATION	OFF UNIT DÉCHARGÉ DU VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	INIT INITI
	ON UNIT CHARGÉ DANS VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	INIT INITI

DATE MONTH DAY YEAR 08 2 12	LEVEL OF SERVICE <input type="checkbox"/> GENERAL	C.O.D. AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> U.S.	Pick Up Information Telephone Number: _____ Contact Name: _____ Ready Date & Time: _____ Closing Time: _____
<input type="checkbox"/> PRIVATE RESIDENCE PICK UP <input type="checkbox"/> PRIVATE RESIDENCE DELIVERY <input type="checkbox"/> PALLETS BEING RETURNED <input type="checkbox"/> HAZARDOUS GOODS* <input type="checkbox"/> APPOINTMENT DELIVERY (DATE/TIME)	<input type="checkbox"/> TAILGATE PICK-UP <input type="checkbox"/> HEATED SERVICE <input type="checkbox"/> TRADE SHOW PU <input type="checkbox"/> INBOND	<input type="checkbox"/> TAILGATE DELIVERY <input type="checkbox"/> TEMPERATURE CONTROL (TL ONLY) <input type="checkbox"/> TRADE SHOW DELIVERY	REQUESTED BY: <input type="checkbox"/> SHIPPER <input type="checkbox"/> CONSIGNEE <input type="checkbox"/> BILL TO <input type="checkbox"/> THIRD EMAIL: _____

*this shipment contains dangerous goods as set out in the attached shipper's declaration

SHIPPER DAY & ROSS ACCT. NO. 038326 TEL NO. 6136325200 SHIPPER'S NAME DART Aerospace PICK UP ADDRESS 1270 Aberdeen St Hawkesbury ON K6A1K7 CITY PROV. COUNTRY POSTAL CODE	CONSIGNEE DAY & ROSS ACCT. NO. _____ TEL NO. 215-233 CONSIGNEE'S NAME Metlap DELIVERY ADDRESS Mark Podob 1000 E. Mermaid Ln Wyndmoor PA 190 CITY PROV. COUNTRY POSTAL CODE
--	--

METHOD OF PAYMENT <input checked="" type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT <input type="checkbox"/> CASH IN ADVANCE AMOUNT _____ CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> THIRD PARTY BILL TO ACCOUNT NUMBER _____ <input type="checkbox"/> VISA <input type="checkbox"/> M.C. <input type="checkbox"/> AMX EXPIRY DATE _____ CARD NO. _____	OTHER BILL TO PARTICULARS BILL TO: _____ BILL TO ADDRESS: _____ GST: _____ CITY PROV. COUNTRY POSTAL CODE
--	---

SPOT QUOTE NO.	ROUTING OR SPECIAL INSTRUCTIONS	MAXIMUM LIABILITY OF \$2.00/LB OR \$4.41/KG COMPUTED ON THE TOTAL ACTUAL WEIGHT UNLESS DECLARED VALUATION STATES OTHERWISE. PLEASE SEE ADDITIONAL TERMS AND CONDITIONS ON REVERSE.
NO. OF PCS.	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	WEIGHT <input checked="" type="checkbox"/> LBS <input type="checkbox"/> KGS
3	Aircraft parts cross tube cardboard cartons	DECLARED VALUE <input type="checkbox"/> CDN <input type="checkbox"/> U.S.
		DIMENSIONS 180 127x13x7
ALL USED HOUSEHOLD GOODS AND PERSONAL EFFECTS SHIPPED AT SHIPPER'S RISK OF DAMAGE		

The uniform TERMS OF CARRIAGE apply to this BILL OF LADING. (See Term and Condition No. 1)

NOTICE OF CLAIM must be submitted in writing within sixty (60) days of delivery. (See Term and Condition No. 2)

The carrier's maximum liability is limited by the TERMS AND CONDITIONS of the Bill of Lading. (See Term and Condition No. 5)

SHIPPER'S REF. NO.	PO 17401
SHIPPER'S SIGNATURE	Brigitte Golden
PRINT	BRIGITTE Golden

PICK-UP DATE	08-02-2012	NO. OF PCS.	
DAY & ROSS DRIVER	Dennis	PURCHASE ORDER	
POWER NO.	270604	TRAILER NO.	1

Aircraft parts

D 350 X-TUBE CUFF MEASUREMENTS AFTER HEAT TREATING

	TYPE	BATCH #	SIDE A TWO READINGS	SIDE B TWO READINGS
1	AFT	84672	2.251"/2.235"	2.257"/2.244"
2	AFT	84677	2.239"/2.245"	2.239"/2.251"
3	AFT	84669	2.238"/2.244"	2.232"/2.255"
4	AFT	84668	2.254"/2.238"	2.256"/2.240"
5	AFT	84675	2.248"/2.238"	2.251"/2.240"
6	AFT			
7	AFT			
8	AFT			
9	AFT			
10	AFT			
11				
12	FWD	84660	2.257"/2.233"	2.253"/2.228"
13	FWD			
14	FWD			
15	FWD			
16	FWD			
17	FWD			
18	FWD			
19	FWD			
20	FWD			
21	FWD			
22	FWD			
23	FWD			

